IN THE CLAIMS

1. (CURRENTLY AMENDED) A flexispline motor comprising a stationary cylindrical electromagnetic core, a rotatively fixed flexispline, and a rotatable hub mounted with bearings on a support, said electromagnetic core being provided with a set of windings to produce a commutated and controlled rotating electromagnetic [[~~magnetic~~]] field so as to provide a radially directed rotating force, a flexispline comprising a [[~~disc~~]] disk portion and hollow cylindrical portion joined together to form an open cylindrical shape having at least one open end, the said flexispline being mounted on said support in such a manner that it encircles and encompasses said electromagnetic core [[~~and is~~]] in a coaxial relationship with said electromagnetic core, said cylindrical shape portion of said flexispline comprising an elastically deformable [[~~magnetic~~]] magnetically permeable material and being in a closely spaced relationship with said core but not touching said core in an unexcited [[~~magnetic~~]] electromagnetic state, said flexispline having [[~~toothed~~]] external gear teeth [[~~gears~~]] formed thereon in the form of an elastically deformable band encircling an exterior surface of the flexispline cylindrical shape adjacent the at least one open end of said flexispline, the said rotatable hub being mounted with bearings on said support adjacent to and coaxially with said flexispline, said hub having a complementary internal toothed ring gear [[~~means~~]] overlying but closely spaced with said toothed external gear [[~~gears~~]] on said flexispline, wherein said open end of said flexispline and its said toothed external gear [[~~gears~~]] being distorted in the presence of a rotating electromagnetic [[~~a magnetic~~]] field in said electromagnetic core to form a multilobed shape such that said toothed external gear [[~~gears~~]] on said flexispline exhibits forcible radial toothed engagement with said internal toothed ring gear on said hub at the protruding lobes on the [[~~a~~]] distorted flexispline multilobed shape formed by the said electromagnetic [[~~magnetic~~]] field causing the rotatable hub to rotate at a reduced rate and higher torque than the resolved rotating radially directed electromagnetic force.

2. (CURRENTLY AMENDED) A flexispline motor comprising a stationary cylindrical electromagnetic core, a rotatively fixed flexispline, a rotatable hub mounted with bearings on a support [[~~means~~]], said electromagnetic core being provided with a set of windings configured to produce a commutated and controlled rotating electromagnetic [[~~magnetic~~]] field so as to provide a radially directed rotating force, a flexispline comprising a [[~~disc~~]] disk flange portion and hollow cylindrical portion integrally joined together to form an open ended cylinder portion

having at least one open end, the flexispline being mounted on said support [[~~means~~]] in such a manner that it encircles and encompasses said electromagnetic core [[~~and is~~]] in a coaxial relationship with said core, said cylinder portion of said flexispline further comprising an elastically deformable magnetically permeable material and being in adjacent relationship with said core but not touching said core in an unexcited [[~~magnetic~~]] electromagnetic state, said flexispline having an elastically deformable toothed internal gear arrangement formed thereon on the interior surface of said cylinder in the form of a band, near the open end of said cylinder portion of the flexispline, [[~~a~~]] the rotatable hub being [[~~means~~]] mounted with bearings, on said support [[~~means~~]] adjacent to and extending coaxially with said flexispline, said hub having complementary external gear teeth formed thereon, said hub [[~~a~~]] complementary external gear [[~~teeth~~]] being encircled by said elastically deformable toothed internal ring gear [[means]] of said flexispline, said hub complementary external gear [[~~teeth~~]] and said flexispline internal ring gear being adjacent to, touching or not touching in an unenergized [[~~magnetic~~]] electromagnetic state, wherein said flexispline is distorted upon the presence of a roptating electromagnetic [[~~a magnetic~~]] field in said core to assume a multilobed shape [[~~and contact said ring gear at protruding lobes of the multilobed shape so formed~~]] such that said internal gear teeth on said flexipline exhibits radially directed forcible engagement with said external gear teeth on said hub at the protruding lobes of the multilobed flexispline shape so formed by the electromagnetic force causing the rotatable hub to rotate at a reduced rate and higher torque than the resolved rotating radially directed electromagnetic force.

3. (CURRENTLY AMENDED) A flexispline motor comprising a stationary cylindrical electromagnetic core, a rotatively fixed flexispline, and a rotatable hub mounted with bearings on a support, said electromagnetic core being provided with a set of windings to produce a commutated and controlled rotating electromagnetic field so as to provide a radially directed rotating force, a flexispline comprising a disk portion and hollow cylindrical portion integrally joined together to form an open cylindrical shape having at least one open end mounted on said support in such a manner that it encircles and encompasses said electromagnetic core and is in a coaxial relationship with said electromagnetic core, said cylindrical shape portion of said flexispline comprising an elastically deformable magnetically permeable material and being in a closely spaced relationship with said core but not touching said core in an unexcited

electromagnetic state, said flexispline having external gear teeth formed thereon in the form of an elastically deformable band encircling an exterior surface of the cylindrical shape adjacent the at least one open end of said flexispline, the rotatble hub being mounted with bearings on said support adjacent to and extending coaxially with said flexispline, said hub having complementary internal toothed ring gear overlying but closely spaced with said toothed external gear on said flexispline, wherein said open end of said flexispline comprising said external gear being distorted radially in the presence of a rotating electromagnetic field in said electromagnetic core to form a multilobed shape such that said toothed external gear on said flexispline exhibits radial toothed forcible engagement with said internal toothed ring gear on said hub at the protruding lobes on the distorted flexispline shape formed by the electromagnetic field causing the rotatable hub to rotate at a reduced rate and higher torque than the resolved rotating radially directed electromagnetic force [[~~A flexispline motor as claimed in claim 1~~]] and wherein said cylinder portion of the flexispline is overwound with a magnetically permeable tape or magnetically permeable wire material and/or shrunk fitted magnetically permeable collars so as to provide locked in compressive radial stress or pressure in the said flexispline.

4. (CURRENTLY AMENDED) [[~~A flexispline motor as claimed in claim 2~~]] A flexispline motor comprising a stationary cylindrical electromagnetic core, a rotatively fixed flexispline, and a rotatable hub mounted with bearings on a support, said electromagnetic core being provided with a set of windings configured to produce a commutated and controlled rotating electromagnetic field so as to provide a radially directed rotating force, a flexispline comprising a disk flange portion and hollow cylindrical portion integrally joined together to form an open ended cylinder shape having at least one open end, and mounted on said support in such a manner that it encircles and encompasses said electromagnetic core and is in a coaxial relationship with said core, said cylinder portion of said flexispline further comprising an elastically deformable magnetically permeable material and being in adjacent relationship with said core but not touching said core in an unexcited electromagnetic state, said flexispline having an elastically deformable toothed internal gear arrangement formed thereon on the interior surface of said cylinder in the form of a band, near the open end of said cylinder portion of the flexispline, the rotatable hub mounted with bearings on said support adjacent to and extending coaxially with said flexispline, said hub having complementary external gear teeth

formed thereon, said complementary external gear teeth being encircled by said elastically deformable toothed internal ring gear of said flexispline, said hub complementary external gear teeth and said flexispline internal ring gear being adjacent to, but touching or not touching in an unenergized electromagnetic state, wherein said flexispline and its ring gear are distorted upon the presence of a rotating electromagnetic field in said core to assume a multilobed shape and wherein both the hub external gear teeth and said flexispline internal ring gear forcibly contact at protruding lobes of the multilobed shape so formed causing the rotatable hub to rotate at a reduced rate and higher torque than the resolved rotating radially directed electromagnetic force and wherein said flexispline is overwound with magnetically permeable tape or [[~~magnetic~~]] magnetically permeable wire material and or shrunk fitted magnetically permeable collars so as to provide locked in compressive radial stress or pressure in the said flexispline.

5. (CURRENTLY AMENDED) A flexispline motor comprising a base, a disk-shape rotatable hub, a hollow post affixed to said base, a stationary cylindrical electromagnetic core and a rotatively fixed flexispline mounted on said base and said hollow post so as to effect a coaxial working relationship with said hollow post, said electromagnetic core being provided with a set of windings to produce a controlled and commutated rotating [[~~magnetic~~]] electromagnetic field so as to provide a radially directed rotating force, the flexispline comprising a [[~~disc~~]] disk flange portion and hollow cylindrical portion integrally joined together to form the general shape of an open ended cylindrical element with at least one open end, and mounted on said support [[~~means~~]] so that the hollow cylindrical flexispline element encircles and encompasses said electromagnetic core and is in a coaxial relationship with said electromagnetic core, said cylindrically shaped portion of said flexispline comprising an elastically deformable magnetically permeable material and being in an adjacent relationship with said electromagnetic core but not touching said electromagnetic core in an unexcited [[~~magnetic~~]] electromagnetic state, said flexispline having an externally toothed [[~~gears~~]] gear [[~~teeth~~]] formed thereon in the form of an elastically deformable band encircling an exterior surface of said flexispline cylinder near an open end of said flexispline, a shaft mounted within said hollow post on bearings for rotation within said hollow post and passing through said base, said shaft being accessible at both ends of the shaft by way of shaft extensions, said shaft being connected to [[~~a disc~~]] the disk shaped rotatable hub at an end opposite said base, a ring gear carried by said hub in a working

relationship with said flexispline, said internally toothed hub ring gear and the flexispline externally toothed [[~~gears~~]] gear having gear teeth that will mesh radially, but [[~~are~~]] differ in number, wherein said open end of said flexispline and said [[~~ring~~]] flexispline gear being distorted in the presence of [[~~a magnetic~~]] a rotating electromagnetic field in said core to form a general multilobed shape such that the flexispline gear teeth exhibit forcible toothed radial engagement with said hub ring gear [[~~on said hub~~]] at protruding lobes on the flexispline multilobed shape so formed by the [[~~magnetic~~]] electromagnetic field causing the rotatable hub to rotate at a reduced rate and higher torque than the resolved rotating radially directed electromagnetic force.

6. (CURRENTLY AMENDED) A flexispline motor comprising a base, a stationary cylindrical electromagnetic core, a hollow post, a rotatively fixed flexispline, and a rotatable hub mounted with bearings on a shaft at a point intermediate between the ends of the shaft, said shaft passing within said hollow post and [[~~magnetic~~]] electromagnetic core and the shaft being supported on bearings, said shaft being accessible at both ends of said flexispline motor, said core being provided with a set of windings to produce a rotating [[~~magnetic~~]] electromagnetic field so as to provide a radially directed rotating force, the flexispline comprising a [[~~disc~~]] disk flange portion and hollow cylindrical portion integrally joined together to form an open cylinder element having at least one open end and mounted on a support to encircle and encompass said electromagnetic core and is in a coaxial relationship with said electromagnetic core, said hollow cylindrical portion of said flexispline comprising an elastically deformable magnetically permeable material in adjacent relationship with and encompassing said electromagnetic core but not touching said electromagnetic core in an unexcited [[~~magnetic~~]] electromagnetic state, said flexispline having an elastically [[~~deformableinternal~~]] deformable internal toothed gear formed thereon on an interior surface of said flexispline cylinder as a band, near the open end of said flexispline, a rotatable hub carrying [[~~a~~]] an external ring gear mounted within said flexispline and extending coaxially with said flexispline, said hub ring gear being encircled by said elastically deformable internal toothed ring gear of said flexispline, said hub ring gear and said internal toothed flexispline ring gear having teeth which will mesh radially but differ in number and are adjacent, but are touching or not touching in an unenergized [[~~magnetic~~]] electromagnetic state, wherein said flexispline internal toothed gear [[~~means~~]] is distorted upon

the presence of [[~~a magnetic~~]] a rotating electromagnetic field in said electromagnetic core to assume an multilobed shape and forcibly contact said hub ring gear at protruding lobes of the multilobed shape so formed by the [[~~magnetic~~]] electromagnetic field causing the said hub to rotate at a reduced rate and higher torque than the resolved rotating radially directed electromagnetic force.

7. (CURRENTLY AMENDED) A flexispline motor as claimed in claim 5 wherein said flexispline is overwound with a magnetically permeable tape or magnetically permeable wire material and or shrunk fitted magnetically permeable collars so as to provide locked in compressive radial pressure or stress in the flexispline.

8. (CURRENTLY AMENDED) A flexispline motor as claimed in claim 6 wherein said flexispline is overwound with a magnetically permeable tape or magnetically permeable wire material and or shrunk fitted magnetically permeable collars so as to provide locked in compressive radial pressure or stress in the flexispline.

9. (CURRENTLY AMENDED) An electromagnetic core for a flexispline motor comprising a magnetically permeable core of a hub and spoke shaped construction, said core comprising [[~~stacked laminations to form a unitary structure having a number of radially spaced rectangular profile poles surrounding said hub, a winding fitted to each pole to produce a magnetic field in each pole, and the windings on each [[groupf]] group of complementary poles on said hub being energized to produce magnetic fields which fields produce a multilobal flexispline distortion of two lobe or three lobe shape.~~]]

a) Stacked laminations or composites to form a unitary structure having a number of radially spaced rectangular cross section poles surrounding said hub and wherein the said core pole faces are skewed longitudinally or tapered longitudinally or both tapered and skewed longitudinally so as to effect a parallel longitudinal air gap between the said core pole faces and the inwardly maximum distorted portions of the flexispline;

b) A winding fitted to each pole or group of poles so as to produce a rotating electromagnetic field in each pole, and wherein the windings on each group of complementary poles on said electromagnetic core are energized and configured electronically to produce

radially directed rotating forces which consequently produce rotating multilobal flexispline distortions of at least two lobe shapes.

10. (CURRENTLY AMENDED) An electromagnetic core as claimed in claim 9 wherein the coils of each group of complementary poles on said [[~~hub~~]] electromagnetic core are connected in a series or parallel relationship.

11. (CURRENTLY AMENDED) An electromagnetic core in a structure [[~~of a~~] for the production of a continuous wave deflection in a magnetically permeable flexispline member in a flexispline motor comprising, a series of stacked magnetically permeable laminations or equivalent composites, stacked to form a unitary core having a hub and spoke configuration, such that a number of rectangular cross section [[~~profile~~]] core legs extend radially from said core hub at evenly spaced intervals, and wherein the said core leg outer pole faces are skewed longitudinally or tapered longitudinally, or both skewed and tapered longitudinally, so as to effect a parallel longitudinal air gap between the core leg outer pole faces and inwardly maximum distorted portions of the flexispline, each leg containing electromagnetic coil windings [[~~coils~~]], each electromagnetic coil being sequentially energized from a source of electrical energy to produce a rotating [[~~electrical field~~]] radially directed electromagnetic force in said electromagnetic core, and wherein **said** [[~~magnetic~~]] forces produced in each opposing complementary group of core legs is in a bucking relationship.

12. (CURRENTLY AMENDED) An electromagnetic core as claimed in claim [[~~13~~]] 11 wherein eight core legs are present, and the source of electrical energy is a four phase source supplying unipolar direct current pulses having frequency and, amplitude control, and electronic commutation [[-~~control~~]] of output current wave forms, and wherein the electromagnetic coils on each pair of opposing pairs of complementary core legs are connected to said source of electrical energy in a series or parallel bucking relationship.

13. (CURRENTLY AMENDED) An electromagnetic core in a flexispline motor, said core comprising a cylindrical configuration and having a series of radially extending rectangular [[~~profile~~] cross section teeth protruding from said core, said core having teeth of variable widths

arranged in a regular sequence around the circumference of said core separated by slots of uniform width and wherein said widths optimize flux saturation levels in the magnetic iron circuit of said teeth.

14. (CURRENTLY AMENDED) An electromagnetic core in a flexispline motor comprising magnetically permeable laminations, or equivalent composites forming a cylindrical core, said electromagnetic core having a series of projecting rectangular [[~~shaped~~]] cross section teeth having two distinct widths separated by slots of equal width, and wherein teeth of lesser width are double the number of the teeth of wider width.

15. (CURRENTLY AMENDED) A winding system for the electromagnetic core of claim 14 wherein each core tooth of wider width is provided with a first coil and a secondary coil is made to encircle said first coil plus the teeth of lesser width on either side of said core tooth of wider width arranged and excited so as to maximize a radially directed electromagnetic force vector.

16. (PREVIOUSLY PRESENTED) A flexispline motor comprising a stationary [[~~an~~]] electromagnetic core, a rotationally fixed flexispline sleeve, and a harmonic gear device wherein: said electromagnetic core is mounted on a stationary member and has a [[~~cylinder~~]] cylindrical shape having [[~~a~~]] wide splined grooves on the exterior surface, wherein said grooves also serve to accommodate electromagnetic core field coil windings incorporated therein, said windings arranged so as to produce a rotating radially directed electromagnetic force in said electromagnetic [[~~said electromagnetic core having a set of windings incorporated therein to produce a rotating magnetic field in said electromagnetic~~]] core, a magnetically permeable sleeve mounted coaxially on said electromagnetic core, said sleeve having the shape of a hollow cylinder having an interior cylindrical surface embodying deformable matching male splines formed in said interior surface to mate with said [[~~splined~~]] grooved exterior surface of said electromagnetic core in a sliding relationship which permits flexing of the male splined exterior surface in a radial direction and transfer of torque but which does not permit said sleeve to move in a circumferential rotational direction, said sleeve having an overlapping end extending beyond said electromagnetic core, said overlapping end of said sleeve having an internal flexible gear formed therein having a predetermined tooth form of constant pitch, a driven gear being mounted

within said overlapping end of said sleeve in a coaxial relationship with said electromagnetic core and said sleeve, wherein said driven gear having external teeth which mesh with said [[~~internal~~]] flexible gear internal teeth and being mounted with bearings so as to permit rotation about a central axis of said sleeve and electromagnetic core, said driven external gear and said internal gear sleeve being in a contacting or non-contacting relationship in the absence of [[~~a magnetic~~]] an electromagnetic field in said electromagnetic core, wherein said sleeve undergoes a cyclical radial elastic deformation in the presence of a rotating electromagnetic [[~~magnetic~~]] field in said electromagnetic core so as to form a rotating multilobed shape such that the internal gear teeth formed in said sleeve, move radially to forcibly contact and mesh with said driven hub gear teeth in the presence of a rotating [[~~magnetic field~~]] electromagnetic force in said electromagnetic core, such that protruding lobes of the multilobed shape so formed ~~by~~ in said sleeve and its internal gear teeth forcibly contact said driven gear, to cause said driven gear to rotate at a lower rate and at higher torque than the resolved rotating radially directed electromagnetic force.

17. (CURRENTLY AMENDED) A flexispline motor comprising a stationary electromagnetic core assembly, and a rotor hub gear, a rotatively fixed magnetically permeable flexispline, said hub gear having complementary gear teeth on a predetermined surface arranged to mesh radially with corresponding gear teeth on the flexispline, said flexispline having an open ended cylindrical shape having at least one open end with a predetermined radius r, said flexispline having a set of gear teeth incorporated in a predetermined surface of said flexispline near the at least one open end of said flexispline, said flexispline teeth being arranged to mesh radially with the coaxial rotor gear teeth, said rotatively fixed flexispline being mounted coaxially within and between a stationary annulus of substantially cylindrically extending electromagnetic [[~~magnetic~~]] core assemblies comprising at least one of:

a) an inner electromagnetic core assembly having a series of salient poles whose number is a multiple of two or three protruding therefrom so that the pole tips of said inner core assembly lie in the locus of a circle having a radius r1, and

b) an outer electromagnetic core assembly having a series of inwardly extending poles equal in number to the poles on said inner core assembly, such that each pole on said outer core assembly is spaced directly opposite from a pole on said

inner core assembly, the pole tips of said outer core assembly lie in the locus of a circle having radius r2 such that r2 is greater than r is greater than r1, and winding elements on said cores to establish two rotating fields in space differing in phase relationship by 90 degrees or 60 degrees, respectively;

c) said poles being electronically configured, commutated and electrically energized so that three equally spaced poles on an outer core of said stator are energized simultaneously and synchronized with three previously selected poles on said inner core, wherein said inner core poles are spaced midway between energized poles on said outer core, said flexispline being therefore deformed from a circular shape into a rotating tricornal shape in the presence of said electromagnetically energized poles;

d) alternatively said poles being electronically configured, commutated and electrically energized in synchronism so that two opposite and equally spaced poles on outer core of said stator are energized simultaneously with two previously selected poles on said inner core wherein said inner core poles are spaced midway between energized poles on said outer core, said flexispline being deformed from a circular shape into a rotating elliptical shape in the presence of said electromagnetically energized pole; and

e) arrangements c) and d) are combined in one flexispline motor generator system so as to effect an electronically controlled and selected dual ratio gear reduction system.

18. (CURRENTLY AMENDED) A prime-mover apparatus, for converting by means of varying magnetic reluctance supplied electrical energy into rotary mechanical motion of a rotor with respect to a stator, about a drive-axis, and/or converting by means of varying magnetic reluctance supplied mechanical torque motion into produced electrical energy by using a stator, a rotatable hub and an electronic commutator, wherein the stator, rotatable hub and commutator comprise [[~~comprises~~]]:

a) an elastically deformable magnetically permeable rotatively fixed cylindrical flexispline overwound with magnetically permeable wire or tape and/or fitted with magnetically

permeable shrunk fitted [[~~collar~~]] collars to produce a locked in radial compressive stress or pressure in the said flexispline;

b) a flexispline annulus having gear teeth, which form a stator-drive-gear; the annulus being sufficiently elastic as to be deformable radially, being electromagnetically deformable in the sense that the flexispline annulus takes on a lobed configuration, upon appropriate radially-directed electromagnetic [[~~magnetic~~]] forces being applied to the annulus;

c) the flexispline annulus having a number [[~~RGT~~]] X of gear teeth, which form a stator drive-gear;

d) a rotatable hub mounted on bearings which forms the rotor-drive-gear which is a solid structure, not electromagnetically deformable into [[~~to~~]] a lobed configuration;

e) the rotor-drive-gear is concentric with the stator-drive-gear,

f) the number [[~~SGT~~]] Y of teeth on the stator-drive-gear is different from the number [[~~RGT~~]] X of teeth on the rotor-drive-gear;

g) the stator-drive-gear and the rotor-drive-gear are so configured that, when the flexispline of the stator has electromagnetically deformed into the lobed configuration, portions of the stator-drive-gear teeth corresponding to the induced lobes of the flexispline move radially into meshing engagement with teeth of the rotor-drive-gear;

h) the stator includes N electrical coils wound around stator core teeth of rectangular cross section [[~~profile~~]] in axial planform and located at respective coil-orientations, around the drive-axis; in a manner such as to minimise the length of the magnetic flux flow path. the coils are so structured, commutated, and arranged that, when energised with electricity, the coils create poles which exert respective radially-directed magnetic forces in a programmed sequential manner;

i) the arrangement of the apparatus is such that the said radially-directed magnetic forces act upon the electromagnetically deformed flexispline, and induce the flexispline to deform into the multilobed configuration;

the rotatable hub comprises:

(a) a solid structure, electromagnetically non-deformable into a lobed configuration.

(b) the rotatable hub provided with a number "Y" of gear-like teeth which in total form a hub drive gear and wherein the number of teeth "X" on the stator drive gear is different from the number "Y" on the hub-drive-gear.

(c) a hub drive gear mounted with bearings concentrically with the stator drive gear, around the drive axis and adjacent to the stator electromagnetic core;

the apparatus including an electronic commutator receiving the supplied electrical energy, and switching supplied electrical energy to the coils, thereby cyclically energising and de-energising the coils sequentially in a rotational pattern around the drive axis, with the unused energy minus losses being returned to the energy source, the apparatus including a cyclic-operator, operating the commutator to energize and de-energize the coils sequentially in a rotational pattern, around the drive-axis;

the arrangement of the apparatus is such that operating the commutator in the rotational pattern drives the lobed configuration of the elastic stator flexispline to rotate around the drive-axis, its speed of rotation being a lobe-rotate-speed [[~~LRS~~]] Z rpm; and

whereby magnified torque output from the rotor-drive-gear is driven to rotate at a speed of [[~~LRS *(SGT-RGT)/SGT~~]] Z * (Y-X)/Y rpm.

19. (CANCELLED)

20. (CURRENTLY AMENDED) A flexispline motor comprising:

a stationary cylindrical electromagnetic core provided with a set of windings to produce a commutated and controlled rotating radially directed electromagnetic [[~~magnetic field~~]] force,

a rotatable hub mounted with bearings on a support,

a rotatively fixed cylindrical flexispline comprising a [[~~disc~~]] disk portion and cylindrical portion mounted on the support to encircle and encompass the electromagnetic [[~~magnetic~~]] core and be in coaxial relationship with the said core,

the flexispline comprising an elastically deformable [[~~magnetic~~]] magnetically permeable material and being adjacent to the core but not touching said core in an unexcited electromagnetic [[~~magnetic~~]] state,

the flexispline having [[~~toothed~~]] external [[~~gears~~]] gear teeth or [[~~external~~]] internal [[~~gears~~]] gear teeth formed thereon in an elastically deformable band encircling an exterior surface or internal surface, respectively, [[~~especitively~~]] of the flexispline adjacent an open end of the flexispline,

the rotatable hub being mounted with bearings on the support adjacent to and coaxially with the flexispline, the **said** hub having complementary ring [[~~gears~~]] gear teeth overlying or underlying, respectively, said toothed external [[~~gears~~]] gear or internal [[~~gears~~]] gear on the flexispline, wherein the open end of said flexispline and its toothed external [[~~gears~~]] gear or internal [[~~gears~~]] gear are distorted in the presence of a rotating radially directed electromagnetic [[~~magnetic~~]] field in the electromagnetic core to form a multilobed shape such that the external toothed [[~~gears~~]] gear or internal toothed [[~~gears~~]] gear on said flexispline provide forcible toothed engagement with the hub ring gear causing hub ring gear to rotate at a lower rate and increased torque with respect to the resolved rotating radially directed electromagnetic field.

21. (NEW) An apparatus for converting by means of varying magnetic reluctance, supplied electrical energy into rotary mechanical high torque motion of a rotatable hub, with respect to a stator, about a drive axis, and/or converting by means of varying magnetic reluctance, mechanical motion into produced electrical energy, by using a stator, the rotatable hub, and electronic commutation, wherein the stator, hub, and electronic commutation are described as follows:

(I) the stator is comprised of (a) and (b):

(a) An elastically deformable, magnetically permeable, annular, rotatively fixed cylindrical flexispline which may be overwound with electrical open circuit, magnetically permeable wire or tape and/or may have magnetically permeable shrunk-fitted collar(s), wherein the layers or collar segment(s) of said magnetic elements are so constructed and insulated to lock in radial compressive stress or pressure in said flexispline, such that its resistance to radial deformation by the appropriate electromagnetic forces is significantly reduced and wherein the layers or segment(s) of said magneticically permeable: wire, tape and collar(s) are electrically open circuit and so constructed and insulated that the effect of eddy currents is minimized;

the flexispline annulus having a number "X" of gear-like teeth, which in total form a stator-drive-gear; the annulus being sufficiently elastic as to be deformable radially, being deformable in the sense that the annulus takes on a multilobed configuration when appropriate radially directed electromagnetic forces are applied to said annulus and wherein the number of said lobes may be configured electronically, and

(b) an electromagnetic permeable stator core, with windings thereon, comprised of "N" electrical coils wound around stator core teeth of rectangular cross section, and located at respective radial coil-orientations around the drive axis, with the stator core placed internal to and within the said flexispline annulus in a manner such as to minimize the length of the magnetic flux flow path, the coils being so structured, commutated, and arranged that, when energized with electricity, the coils create electromagnetic poles which exert respective radially-directed electromagnetic forces which rotate around the drive axis in a programmed sequential manner, such that the radially-directed electromagnetic forces act upon the flexispline annulus and induce said flexispline to deform into the multilobed configuration; and

(II) the rotatable hub comprising:

(d) a solid structure, non-deformable into a lobed configuration;

(e) the hub provided with a number "Y" of gear-like teeth which in total form a hub drive gear and wherein the number of teeth "X" on the stator drive gear is different form the number "Y" on the hub-drive-gear; and

(f) a hub drive gear mounted with bearings concentrically with the stator drive gear, around the drive axis and adjacent to the stator electromagnetic core; and

(III) the stator-drive-gear and the hub-drive-gear are so configured that, when the flexispline annulus of the stator has electromagnetically deformed into the lobed configuration, portions of the stator drive-gear teeth corresponding to the protruding lobes of the flexispline annulus, move radially into meshing engagement with teeth of the hub-drive-gear thus varying the stator magnetic reluctance; and

(IV) the apparatus includes an electronic commutator which receives supplied electrical energy and switches said energy to the stator coil windings, thereby cyclically energizing and de-energizing the coils sequentially in a controlled and programmed rotational pattern around the drive axis, with the unused or generated energy, minus losses, being returned to the energy source; and

the apparatus also includes a cyclic-operator, which operates the said electronic commutator to energize and de-energize the said coils sequentially in a rotational pattern around the drive axis wherein arrangement of the apparatus is such that operating the said cyclic-operator and said commutator drives the deformed multilobed configuration of the flexispline

annulus to rotate around the drive-axis at lobe-rotate-speed "Z" rpm and whereby output from the rotor-drive-gear is driven to rotate at a speed "R" whereby "R" is determined by: R = Z * (X - Y) / X producing a higher torque output and reduced output rotational rate compared with stator field rotation excitation.

22. (NEW) The apparatus of claim 21 wherein the stator coil windings are wound using super conducting wire material.

23 (NEW) A method of using the motor generator of claim 21 comprising a method of exciting and commutating stator phase windings which have first and second ends comprises:

1) supplying a unidirectional pulsed direct current source of electrical power, having a positive and negative bus, to each phase windings and,

2) connecting a first switch S1 between said positive bus and said first end of said windings and,

3) connecting a second end of said windings to said negative bus of said power source and,

4) connecting a second switch S2 between said negative bus and said second end of said windings and,

5) connecting a first reverse poled diode D2 between said first end of said windings and said negative bus and,

6) connecting a second reverse poled diode D1 between said second end of said windings and said positive bus;

and whereby the process of sequential commutation in each phase is achieved in three stages namely:

a) Stage-1 voltage is supplied to phase coil windings, charging same and allowing current to rise to a predetermined level wherein switches S1 and S2 are closed and conducting, whereas diodes D1 and D2 are non conducting.

b) Stage-2 current is maintained at a predetermined level by switching voltage on and off by means of pulse width modulation by switching S2 on, and switching S1 on and off repeatedly, or by switching S1 and S2 on and off repeatedly, or alternatively by current regulation.

c) Stage-3 current supply from source to phase field coils is switched off and said coils are discharging current and stored energy, with said discharge current flowing back to energy source and wherein switches S1 and S2 are open and non-conducting and whereas diodes D1 and D2 are conducting, the magnetic core iron is defluxing, and the discharge current tail is curtailed.

24. (NEW) The apparatus of claim 21 wherein a diameter of the cylindrical electromagnetic core and teeth are tapered and or skewed longitudinally so as to effect a parallel air gap between said core's outer diameter and a distorted flexispline minimum diameter when the flexispline is deformed.

25. (NEW) A flexispline motor according to claim 18 wherein the stator coil windings are wound with super conducting wire material.

26 (NEW) A method according to claim 21 for converting the generally balanced and unused, high radial force which exists between the electromagnetic pole tips and back iron or soft iron target of electric machines of the motor generator category into rotary torque by means of the inclined plane or wedge effect principle of radially meshing gear-like teeth in a harmonic drive flexispline arrangement.

27. (NEW) A motor generator comprising the flexispline motor of claim 5 connected to a plurality of said motor generators wherein the said electrical motor generators are coupled shaft to shaft so as to comprise a common shaft to form a distributed system of torque and electrical energy production wherein on demand some of said machines produce torque and some produce electrical energy, or alternately all produce torque or all produce electrical energy.

28. (NEW) A motor generator comprising the flexispline motor of claim 6 connected to a plurality of said motor generators wherein the said electrical motor generators are coupled shaft to shaft so as to comprise a common shaft to form a distributed system of torque and electrical

energy production wherein on demand some of said machines produce torque and some produce electrical energy, or alternately all produce torque or all produce electrical energy.

29. (NEW) The motor generator of claim 27 wherein the stator coil windings of all said motor generators are wound with super conducting wire material.

30. (NEW) The motor generator of claim 28 wherein the stator coil windings of all said motor generators are wound with super conducting wire material.